

What is Claimed is:

1. A storage capacitor plate for a semiconductor assembly comprising:

a substantially continuous porous conductive storage plate comprising silicon nanocrystals residing along coplanar surfaces of a conductive material and an insulative material adjacent said conductive material.
2. The storage capacitor plate claim 1, further comprising a polysilicon layer residing between said silicon nanocrystals and said surfaces of said conductive material and said insulative material.
3. The storage capacitor plate of claim 1, wherein said silicon nanocrystals comprise spherical single crystal silicon particles having narrow size distributions and diameters down to less than 100Angstroms.
4. A storage capacitor plate for a semiconductor assembly comprising:

a substantially continuous porous conductive storage plate comprising silicon nanocrystals residing along sidewall surfaces of an opening in a insulative material planarized and along a surface of a conductive material lying beneath said opening, said silicon nanocrystals contain conductive impurities.
5. The storage capacitor plate of claim 4, wherein said silicon nanocrystals substantially fill said opening.

6. The storage capacitor plate of claim 4, wherein said silicon nanocrystals comprise spherical single crystal silicon particles having narrow size distributions and diameters down to less than 100Angstroms.
7. A storage cell for a semiconductor assembly comprising:
 - a substantially continuous porous conductive storage plate comprising silicon nanocrystals residing along coplanar surfaces of a conductive material and an insulative material adjacent said conductive material;
 - a conformal cell dielectric lying on exposed surfaces of said substantially continuous porous conductive storage plate;
 - a conductive top cell plate.
8. The storage cell claim 7, further comprising a polysilicon layer residing between said silicon nanocrystals and said surfaces of said planarized conductive material and said planarized insulative material.
9. The storage cell of claim 7, wherein said silicon nanocrystals comprise spherical single crystal silicon particles having narrow size distributions and diameters down to less than 100Angstroms.

10. A storage cell for a semiconductor assembly comprising:

a substantially continuous porous conductive storage plate comprising silicon nanocrystals residing along sidewall surfaces of an opening in a insulative material planarized and along a surface of a conductive material lying beneath said opening, said silicon nanocrystals contain conductive impurities;

a conformal cell dielectric lying on exposed surfaces of said substantially continuous porous conductive storage plate;

a conductive top cell plate.

11. The storage cell of claim 10, wherein said silicon nanocrystals substantially fill said opening.

12. The storage cell of claim 10, wherein said silicon nanocrystals comprise spherical single crystal silicon particles having narrow size distributions and diameters down to less than 100Angstroms.